Illinois Commerce Commission - Energy Division
Staff Report to the Electric Policy Committee
Distributed Resources

The Electric Policy Committee of the Illinois Commerce Commission issued a request for comments concerning distributed resources ("DR") and their effect on Illinois energy markets on October 27, 1999. The stated purpose of the request was to gain a better understanding of what distributed resources are, their applications in the energy markets, and what effects current and future policy decisions within the State of Illinois will have on them. This report responds to the DR topic by providing a question by question response.

Background

There has been a progressive shift away from monopoly control of power generation in the past twenty-five years. This was caused by legislation such as the Public Utilities Regulatory Policies Act (PURPA) in 1978, which called for special handling of "qualifying facilities" or small renewable power sources, the 1987 repeal of the Power Plant and Industrial Use Act of 1978, which had placed restrictions on the use of natural gas in the production of electric energy, and the opening of the transmission markets through the National Energy Policy Act of 1992, the FERC Mega-NOPR in 1994 (RM-94-7-000) and FERC Orders 888 and 889 in 1996. By the end of 1998, non-utility and small production facilities represented an 11.4% share of net generation in the US. The majority of these facilities are natural gas fired generators that have developed since the lifting of restrictions for the use of natural gas in electric production. Only about one quarter of the 11.4% market share stated above was from renewable sources.

States also began to look into deregulation in conjunction with the above mentioned federal policy changes. In 1997, the State of Illinois passed the Electric Service Customer Choice and Rate Relief Act. Coupled with the emerging competitive transmission and generation markets, Illinois' efforts in opening the retail markets to competition are furthering the potential growth of non-utility and small power generators within the state.

The Electric Policy Committee's questions focus on what, if any, barriers exist to efficient utilization of DR. In the following responses, Staff addresses possible hindrances to the development of DR in the Illinois markets and whether or not they result from current policy or rate design. Staff believes that DR located in Illinois could benefit consumers through the offering of additional power supply choices, reduced costs from load relief on both transmission and distribution systems, and more efficient employment of the resources needed to serve the needs of Illinois' consumer base. Staff recommends that policies addressing DR in Illinois be directed at removing barriers to the efficient utilization of DR other than promotion of DR through subsidies or other artificial advantages. Subsidization of DR through regulatory incentives will distort the markets and could foster the creation of inefficient DR resources which could ultimately lead to higher energy costs for Illinois consumers.

Question Responses

1a. Please provide an exact definition of a distributed resource (DR). For example, is a distributed resource only small-scale generation? If so, of what size? Should DSM services also be included in the definition?

A definition of DR can be drawn from work already performed by the California Energy Commission ("CEC") and the California Public Utilities Commission ("CPUC"). In the CPUC Order to Institute a Rulemaking (OIR) #98-12-015 and the round table discussion of distributed generation sponsored by the CEC in their publication #P101-96-001, DR is defined as follows,

> Distributed generations and/or distributed energy resources are generation, storage, or demand side management devices, measures, and/or technologies that are connected to or injected into the distribution level of the electric transmission and distribution grids on either the customer side or utility side of the meter or elsewhere on the distribution grid.

For the purpose of this paper, energy storage technologies are not treated as a separate category of DR. They are considered in both the generation and DSM summaries below due to the dual application of stored energy systems.

Distributed Generation Resources

Distributed generation resources consist of a wide range of devices that are designed to produce electrical power. A list, not intended to be exhaustive, would include small scale turbine generators, microturbine generators, internal combustion generators, photovoltaics or solar panel technologies, wind turbine generators, geothermal technologies, biomass generators, and fuel cell generators. While no detailed description of these technologies will be given in this report, many of them are addressed in the EDIV Staff Research Paper - Microgeneration Technology Report, which is available on request. As mentioned above, energy storage technologies are also employed as alternative generation options.

Although these technologies differ in fuel employed and generation process, all are similar in that they are designed to be more easily installed than conventional generation and can be tailored to the individual needs of the customers or utilities employing them. In addition, most of these technologies do not require an extensive amount of site work or large structures to house them. These advantages over conventional power plants make DR well suited to address supply and load concerns in specific areas of a distribution grid or specific needs of individual consumers.

Distributed Demand Side Management Resources

Distributed demand side management resources may provide cost savings by reducing total energy use, reducing peak loads, and/or by improving power factors. Such changes can reduce both generation and distribution system maintenance costs.

Some of the technologies/activities currently employed as DSM technologies include storage devices, capacitor banks to correct the power factor of the electrical supply, and high-speed switches. In addition to these distribution system hardware technologies, many proponents of distributed technologies include technologies/activities that are directed to reduce system-wide or area-wide load requirements. These include retail based activities of energy management systems, time-of-use electric rates, arrangements for direct load control by local utilities (lower rates when utility's are able to turn off customer equipment when necessary), interruptible or curtailable electric service options (lower rates for customers who shed load at utility's request), and utility dispatch of a customer generation capacity (units available to the utility for load management).

The answer to the questions asked as to whether a size limitation should be applied to DR or if DSM activities should be included depends on the intent of the Commission. If it is the Commission's desire to foster development of a particular size of DR facility or specific DSM activity, then limits incorporated into the definitions, when accompanied by incentives directed toward DR or DSM, could accomplish these goals. The State of California has taken this approach in their DR work.

The CPUC, in providing its definition of DR with a maximum capacity of 20 MW, attempted to target smaller production facilities for further development within their state. Their position was that, at this level of capacity, a DR would be large enough to support an entire distribution load center of the system, which could lower the costs of getting power to retail customers. It was also considered that, at a 20 MW level, the facility would be limited in its capability to enter into wholesale activities. By creating policy supporting small units in an effort to discourage wholesale trade, the CPUC position was that cost savings from providing less wire and fewer connections (transformers - relays) between the power supply and the end user, and the savings from reducing line loss and congestion on the transmission and distribution grids, would go directly to the retail customers instead of a third party power marketer or middleman.

While this approach might be what California was looking for, unless it is the specific intent of the Illinois Commerce Commission to target a specific area of DR development, Staff favors a more even-handed policy that would allow generation or storage DR of any size to locate on the distribution system. Furthermore, there is no justification for limiting DR to the retail markets only. If lower costs make it economically feasible for the DR to sell at the retail or wholesale levels, then activity at either level would be favorable to the state markets. Limiting the DR's market or size could work to unduly limit the DR applications.

Most sources openly include DSM activities as DR. However, concern about how much DSM activity is included and targeted by policy has been raised by companies like Distributed Utilities Associates (DUA), a prominent distributed resource installation and engineering company out of California. Although all DSM activity has an effect on system load and ultimately the cost of distributing power, DUA's position is that policy should be directed only toward utility implemented DSM activities on the system. Their argument is that other customer-based DSM technologies, such as energy efficient lighting or HVAC systems, are already part of competitive markets. Policy interference in these areas of DSM activity would distort the competitive markets and could give utilities an unfair advantage over other market participants.

Staff agrees that DSM activities should be included in the definition of DR without limitations unless it is to accomplish a specific purpose set forth by the Commission. Again, the argument comes down to what the Commission is attempting to accomplish with its definition of DR. If more DSM activity is desired, then policy can be tailored to accomplish this goal. However, without such a defined goal at hand, Staff is cautious about unduly limiting the definition of DR, which could cause policy to inadvertently hinder DR development.

1b. How can DR be used either in conjunction with traditional utility service or as a stand-alone service to meet customers' demands?

As briefly described above, there are many applications of DR in the electric markets. Due to the summer peaking nature of the Illinois electric energy market, it has become a viable option for many large energy users to capitalize on the low cost of gas during these periods by installing gas fired self-generation or back-up generation supplies. This enables them to avoid high market prices for power when system demand peaks. While gas is the most widely used fuel in today's DR market, it should be noted that DR applications could consist of a variety of different fuel technologies. In any event, the end result is an ability to lower energy bills by installing DR applications. In addition, the DR applications also assist the system they are located on by reducing line loading and freeing up resources for other uses. Excess production from these facilities could also benefit other customers by providing them additional power supply choices as power is sold by the DR acting as an alternative retail electric supplier (ARES).

Utilities can also benefit from installing generation DR on the system by escaping the congestion effect of transporting power across the entire distribution system to serve remotely located customers. In a growing community, this can reduce the need for upgrades to existing distribution system equipment as load is shifted to other paths, which will lower costs to the system as a whole. This also applies to the transmission systems that will benefit from the load relief provided by DR by reducing the amount of power the transmission system is required to deliver onto a distribution system.

1c. Can DR be effective in providing loading relief for transmission and distribution systems? Should DR be considered when planning for and expanding the T&D system? What new technologies can be used in conjunction with DR to lower costs and improve service?

These three questions were grouped together due to the similarity of the responses. As discussed above, DR can effectively provide loading relief for transmission and distribution lines by placing the generation source as close to the end user as possible. This reduces the congestion that might occur if all power had to flow across the entire distribution system and can work to reduce transmission system congestion by reducing the need to "wheel" power in from outside the distribution system.

In understanding the relief that DR might provide to the loading of a system, planning for system expansion and upgrades should take DR into account to minimize the amount of investment made to the physical distribution system. By knowing that power will not have to be supplied across an entire grid to end users, sections of the grid might not have to be upgraded as demand grows or new areas of the system could be built smaller than they would have been without DR in place. This could lower costs to the distribution system and provide savings to end-users. Although there are possible benefits of DR placement on a system, Staff believes that the weighing of the DR options are ultimately going to be situation specific. Utilities need to consider the possible material effects DR options will have on their systems.

1d. Are there any other benefits from DR (e.g., environmental)? What are the drawbacks of DR (e.g., utility operations, public health and safety, etc.)? (Please include examples of currently deployed distributed resources either in Illinois or other jurisdictions and explain exactly what services (or value) these resources provide. (If providing examples of DR outside of Illinois, please indicate any unique features of the regulatory or legal environments of that jurisdiction that differentiate it from Illinois as it pertains to DR.)

The benefits from DR can vary dramatically depending upon the type of DR employed. Renewable technologies, such as wind and solar applications, provide a definite reduction in the demand for energy from generating plants that produce harmful emissions. They also utilize renewable fuel sources, which conserves non-renewable resources. One drawback is that these units can be considered unsightly, consisting of large solar arrays on rooftops or towers jutting out of the landscape with turbines on them. Other arguments have been made against wind technologies and their effect on wildlife as well as against the constant noise of the rotors.

The benefits of fuel cells are much the same as with the solar and wind technologies. By using a clean fuel, there are almost no emissions from the units, which makes them very environmentally friendly. They also produce other outputs such as heat and water that provide additional benefits to their operation. The only environmental drawback comes over time from disposal of the spent chemical or electrolyte core.

As with any DR, distributing resources around the system also distributes any risks associated with them. This raises public safety concerns as power generators and their fuel supplies are taken closer to the public. Not only can there be public safety concerns, but there could also be an effect on property values in the area of DR location. Combined, these drawbacks will fuel most of the zoning debates surrounding the location of a DR.

2. What is the market penetration for DR in Illinois (include self-generation and co-generation if not included in your definition provided in question 1)?

At the end of this report is a table taken from the Department of Energy's web site. The table is the "Existing Capacity at U.S. Nonutility Power Producers by State and Facility as of December 31, 1998." Data for this table is drawn from the mandatory EIA 860B - Nonutility Power Producer Report. The list includes eighty-eight facilities owning and operating generation facilities in the State of Illinois with capacity of 1 MW or greater. In general, all of these facilities can be considered DR, though some are tied to transmission facilities (voltages higher than 69 kv) and not typical distribution facilities. However, the division of distribution and transmission facilities by voltage is subjective and should not necessarily be used as a benchmark for the DR debate. FERC provides a seven-factor test to determine the accepted classification of facilities. Order No. 888, Promoting Wholesale Competition Through Open Access Non-discriminatory Transmission Services by Public Utilities; Recovery of Stranded Costs by Public Utilities and Transmission utilities, Docket

Nos. RM95-8-000/RM94-7-001, 75 FERC 61, 080, slip op. at 402 (Apr. 24, 1996)("Order No. 888") Below is a brief description of the technologies employed as DR and their abilities to further penetrate Illinois markets.

As mentioned earlier, there are several different types of distributed generation technologies. Natural gas fired units have become the most popular resources. With gas usually hitting its lowest price when electric demand is at its highest, this type of DR has been the fastest growing in the Illinois market. Most systems in Illinois already employ this technology either as base load generators or peaking units.

Modern wind generation technologies can begin producing minimal power levels in six-mph winds. However, for adequate levels of power supply, winds in excess of ten mph are required. As reported by the Pacific Northwest National Laboratory, only a small portion of the State of Illinois has an average sustained wind above six mph at one hundred sixty four feet of elevation. This limits the economic feasibility of wind technology in Illinois as a DR application at the current price levels for the technology. Though there are currently wind technologies employed in Illinois, most are too small to offset all power requirements of the owners.

Solar technologies have similar restrictions in Illinois markets. This technology is most viable in the Southwest where the sunlight is not only more direct but occurs for longer periods of time without atmospheric interruption. In Illinois, however, large-scale solar technologies are just not feasible given the variability of weather in the state. Small-scale solar applications on the other hand, have been around for many years. Using solar arrays to gather sunlight to offset part of the cost of heating homes or swimming pools has become more popular as the costs of solar technologies has come down. There have even been recent breakthroughs in solar shingles that can cover the entire roof of a house to serve as a supplemental power supply, though the price still makes it an unprofitable alternative to conventional power sources at this time.

The fuel cell is an old idea that has just recently become more popular through technological advancements that have brought the price to a reasonable level. Powered by gas fuel (natural gas, methane, propane, etc.), the fuel cell, through a chemical reaction process, produces electric energy with heat and water produced as byproducts. Because of the fuel type, it is almost emissions-free with only a spent chemical or electrolyte core to replace over time.

A recent article in the December 1, 1999, edition of the Chicago Tribune reported that NiSource and the Institute of Gas Technology have entered into an agreement to market a residential fuel cell to run on natural gas or propane. The unit is being built by Mosaic Energy LLC, a partnership forged by NiSource and the Gas Institute, and is planned to be available in about two years. Not only will residential customers be able to convert gas into electricity, thermal energy for heating, and water, they will also be able to do it for an estimated initial investment of $3,000. Although these units will be sized to the typical residential load of 3 to 5 KW, as estimated by NiSource, larger fuel cells are already being efficiently employed across the country in a wide variety of applications.

With prices for this technology coming down and because of its other outputs of thermal energy and water, the fuel cell seems to have a promising future in DR applications. However, actual cost comparisons of the fuel cell to overall current energy usage (gas plus electric) are not available to determine the benefit the fuel cell will actually deliver to the retail customer.

Co-generation, hydro, and biomass facilities provide definite benefits through the more efficient utilization of resources. However, their penetration into Illinois markets is limited. Currently there are co-generation and biomass facilities in operation and being planned in the State of Illinois, but the growth in the number of these energy facilities is dependent on availability of specific industrial applications. Co-generation facilities are limited to industries that produce thermal or other energy as a result of their manufacturing process. Many Illinois industries that have this capability have already utilized it to some extent. The same is true for biomass generation, which is limited to industries that produce a combustible fuel as a result of some other manufacturing process. With Illinois' agricultural base, biomass generation development is a possibility. However, due to emission restrictions contained in the Clean Air Act, high costs must be incurred filtering flu gas emissions before they are released, which makes this a less attractive option than other DR.

As for hydro facilities, due to the topography of Illinois and the federal and state restrictions placed on the use of waterways, there will be very limited growth in this fuel source as well. There are just too many obstacles to overcome for hydro facilities to be attractive energy supplies. Although there are four known hydro facilities in the state, two (City of Kankakee and City of Peru) are owned by municipal utilities and the other two are only about 3 MW each.

The penetration of DSM DR activities in the market is already wide spread. All utilities currently offer DSM type rates, such as time-of-use or seasonal rates, as both bundled and unbundled services. In fact, most of the existing generation DR applications are already taking advantage of DSM type rates or agreements in conjunction with the DR. Not only do generation DR applications take advantage of these rates, but DSM technologies, such as energy storage devises and capacitor banks, can also provide savings in conjunction with the bundled DSM rates in place from the utility. While most of the DSM work has been done by utilities, there are new companies constantly entering this market, bringing with them both conventional and non-conventional solutions to load management problems.

3a. What should the Commission's role, if any, be in promoting this market? If the Commission should have a role, please provide an outline of actions the Commission can take along with a timetable.

In addressing the role the Commission should play in the DR market we must refer back to the goals expressed within the Public Utilities Act. As stated in Article 1 Section 1-102 of the Act,

> The General Assembly finds that the health, welfare and prosperity of all Illinois citizens require the provision of adequate, efficient, reliable, environmentally safe and least-cost public utility services at prices which accurately reflect the long-term cost of such services and which are equitable to all citizens. It is therefore declared to be the policy of the State that public utilities shall continue to be regulated effectively and comprehensively. It is further declared that the goals and objectives of such regulation shall be to ensure efficiency, environmental quality, and reliability.

Staff does not believe that open promotion of DR is necessary to achieve these goals. Staff believes the Commission's role should be focused on removing artificial barriers to DR that might currently exist. Subsidization of DR through regulatory incentives will distort the markets and could foster the creation of inefficient DR resources which could ultimately lead to higher energy costs for Illinois consumers. Subsidization could also disrupt existing relationships between customers and suppliers for DR resources and hinder future DR development.

3b. How does the manner in which the Commission has unbundled delivery services from generation services impact the cost-effective application of distributed resources?

The unbundling of delivery services from generation has worked both for and against DR development in the state. By separating delivery services from generation, the Commission has provided additional opportunities to market power from DR applications. This itself fosters the development of DR on the distribution systems. However, restructuring provided retail customers with choices other than those offered by DR. Not only have utilities been allowed to offer products that can directly compete with DR, ARES can now sell products in a utility's service territory as well. This can work against DR development if the utility or ARES is able to offer these products at a lower ultimate cost.

3c. What aspects of current delivery service rate design should be altered to facilitate the cost-effective deployment of DR?

Current delivery service rate design includes the provision for transition costs to be recovered by native utilities. Whether or not transition costs are justified, they do provide disincentives for ARES DR applications. By attaching additional costs to the ARES' product, the relative attractiveness of the product can be reduced.

Another area of delivery service rate design that Staff is concerned about is scheduling and balancing requirements. With artificially high scheduling requirements placed on DR, the development of DR could be hindered. This is especially true when the DR produces a surplus that is less than the 1 MW minimum scheduling requirement specified in FERC approved transmission tariffs. In that instance, the DR would be limited to a wholesale market that included only the utility on whose distribution system it was located because it could not provide the minimum scheduling requirement needed to access the transmission system.

Excessive balancing penalties could also be harmful to DR to the extent that it could deter them from entering markets that require the use of transmission facilities. That could not only hinder future development or growth of the DR itself, but the ultimate benefit to consumers.

3d. Should delivery service rates be geographically differentiated to provide the appropriate price signals to locate DR in areas that need distribution upgrades?

Staff agrees that geographically differentiated rates could be adapted to foster DR development where it would relieve distribution system constraints or deficiencies. However, managing rates of this type might prove to be more costly than the benefit they provide. It is Staff's position that, in principal, if the utility receives a benefit from a DR on its system due to the physical location of the DR, then the DR should be due some compensation from the utility for that benefit. However, it might be easier to provide for this compensation through a credit applied to current tariffied rates rather than developing specific rates to induce DR development in these areas of the system.

3e. Should the Commission develop a common set of interconnection rules/tariffs for the state?

The issue of standardized interconnection requirements was also raised under Article 16 Section 118a of the Public Utilities Act (PUA). Although the PUA called for these standards, currently only the requirements of the National Electrical Code and National Electric Safety Code are applied to ordinary interconnections. Interconnection standards work was done as part of the PURPA "qualifying facility" legislation - Illinois Administrative Code: Title 83, Chapter 1, Subchapter c, Part 430 - Purchase and Sale of Electric Energy from Cogeneration and Small Power Production Facilities, but this does not apply to all DR.

Under Part 430, the interconnections of and interactions between "qualifying facilities" and native utilities were defined. Section 430.40 specifically provides the Terms and Conditions of Service, which include interconnection and electrical code requirements. Part 430 could provide a benchmark for DR interconnection standards. In addition, with the future prospects of economically efficient small power supply options, the possibility of low voltage interconnections (residential or small commercial) is increasing. Standardized interconnection requirements would facilitate deployment of DR.

Interconnection standards were also addressed by the CPUC in their DR debate. The discussion by the CPUC tied interconnection standards to the size limitations on DR that they had proposed in their OIR. By limiting the size of DR in the California debate, the CPUC argued that instituting standardized interconnection and licensing requirements for small DR applications would be less burdensome than for plants that were larger than the proposed 20 MW. While Staff agrees that standardized interconnection requirements should be implemented not only to relieve administrative burden but to also provide protections against non-competitive activity by the native utilities, Staff does not support limitations placed in the definition of DR to accomplish this goal. If standardized interconnection rules are established, and if it is deemed that interconnections between utilities and larger DR call for different requirements than the interconnection of small DR, then two sets of standards could be established to handle this occurrence.

3f. What other changes in legislation, rules, tariffs, unbundling polices and interconnection practices are needed to facilitate the deployment of cost-effective distributed resources?

While Staff can not identify additional areas of regulatory concern that might hinder DR development in Illinois other than those identified above, Staff does have concern about the desire of DR to establish distribution competition. Many of the existing DR on the Illinois distribution systems are located at facilities that own their own on-site distribution systems. With this in mind, it is not inconceivable that efficient nonutility owned DR would attempt to become an ARES by offering power not only as a wheeled service across the native utility's system but also across their own installed system immediately surrounding the DR. This might raise the question of "First in Field" and whether or not native utilities have the exclusive right to the ownership and operation of all distribution systems in their territory. Since distribution competition has not apparently been authorized in Illinois as of yet, it appears that the monopoly control of distribution facilities is still in effect. Though this might impose constraints on ARES DR, Staff does not believe these constraints constitute significant impact on DR development. However, if ARES DR can provide distribution services more efficiently or at a lower cost than the native utilities, removing the restrictions on distribution system ownership could provide benefits to consumers and further DR development.

If distribution competition is in the future for Illinois, several things should be considered before a final move to competition is made. Specifically, if distribution competition is allowed, the Commission should attempt to ensure that new additions to distribution facilities by DR will not hinder future growth of the system. In a competitive world, the tendency to install only what is needed to serve the identified load would be considered the most cost effective employment of resources. Although some planning for growth might occur, if a DR application is limited to the number of customers it can serve or the maximum load it can provide, it will only size its distribution system to take this into account. However, planning for growth in the distribution system beyond the DR's service area is essential to a growing community. Under competition, if the utility is removed from the oversight of distribution system expansion, no authority could be found in existing policy to require nonutility owned DR to plan for additional expansion beyond their systems. This would restrict the economic potential of the community and could lead to higher distribution costs to the retail customers if the utility is required to install distribution systems parallel to the DR's systems to get power around the "distribution pockets" that DR have created on the system.

4. What are the requirements in terms of metering, metering standards, data control and management, communications and utility operations for the central dispatch of distributed resources? (Please provide a summary of the assumptions made concerning the distributed resource technology, the structure of the electricity market and the nature of the distribution system used to formulate your answer.)

While there are many requirements for interconnection to a utility system, including inter alia, switches, meters, relays, the only additional physical requirement to allow for the central dispatch of the DR is the communications software required to allow the utility to remotely dispatch the DR. There are also data reporting requirements stated in the Illinois Administrative Code, Title 83, Chapter 1, Subchapter c, Part 430, which allow the utility to know the capacity and reliability of the DR being dispatched. These requirements are more for reliable system operation and are not necessarily required for the physical process of central dispatch.

5. What aspects of past distribution planning and deployment hinder the development of the DR market?
Are there specific areas on any utility's system that are particularly problematic for DR?
What actions can the Commission take to alleviate any perceived problems?

Any established distribution system has inherent peculiarities. If utility distribution systems were constrained in their construction and were not sized to allow for the flow of large amounts of power, then DR wishing to connect to them would be limited in size unless they were willing to upgrade the existing system to allow for the larger flows. The same is true for systems that have been aggressively loaded. If the system is already at ninety percent of its volume, very little extra power from DR can be placed on the system without harming the system. This could work against the development of DR.

There is also a possibility of congestion on a distribution system. In heavily loaded areas of a distribution system, any power placed on the system by the DR in those areas could increase the congestion and could not only increase line losses and hardware strain but could also put the system at risk. This risk can be mitigated by reasonable interconnection requirements. Before a DR can interconnect, the utility must first approve the interconnection and can require the DR to provide additional hardware if their interconnection will threaten the reliability of the system.

Technical distribution system problems may occur as DR development progresses. However, due to the varying nature of the problems that can arise on distribution systems, problems of this nature might have to be solved on a case by case basis instead of by a global set of rules.

6. Do the incentives currently inherent in the regulation of the incumbent electric utilities hinder or facilitate the cost-effective application of distribute resources by alternative suppliers? Please explain. If the current structure hinders efficient deployment, what changes are needed?

One possible disincentive for DR development is in the calculation of avoided costs when dealing with PURPA qualifying facilities. If the utility can understate its regulated avoided cost, they could restrict the DR from entering the market by establishing a much lower price for the DR's power than would be needed to make the DR a sound economic choice. The way to guard against this is to take appropriate steps to insure that the calculated avoided costs are just and reasonable.

A second disincentive provided in legislation is the utility's ability to collect transition charges from customers leaving the utility's service. The transition charges themselves increase the cost to the retail customers above the ARES DR power prices. If the total cost of power supplied from the ARES DR to the customer, plus the transition charge imposed by the utility, raise the price above other utility or ARES options, customers will be less likely to choose the DR option. Not only can transition costs provide a disincentive to choosing the ARES DR option, they could also provide a disincentive for ARES DR development. If the transition costs are high enough, the DR might not locate on the system or, in the case of self-generation DR, they may never attempt to become ARES.

The absence of regulatory policy in areas of Commission authority can also provide advantages to native utilities. As mentioned earlier, a utility's scheduling, balancing, or interconnection requirements for a distribution system place restrictions on DR in the market. If the utility overstates its requirements, DR development could be hindered. These restrictions could even make it impossible for small DR to become ARES if their available capacity is less than the minimum scheduling requirements or if imbalance fees or interconnection standards are set higher than warranted.

7. Does the incumbent utility have any market power associated with planning, leasing or dispatching DR? Is this any different from central station generation? Can that market power be mitigated? How?

Planning and leasing of distribution system hardware seems to be where most market power abuses could occur. It is possible that a utility could block DR location on their system by overstating constraints on their system. Since current regulation allows for utility oversight in interconnections, the utility could use this to its advantage in disallowing DR to locate in particular areas of its system or on the system entirely. The same is true if the utility understates the available room on their system for additional power flows in an effort to block larger DR development. However, Staff believes that DR have recourse with the Commission to review the utility's decisions on these matters.

Market power abuses in the leasing of DR do not seem to be relevant. Since the utility is not the only outlet available for DR leasing, excessive pricing or abuses would merely provide incentives for other sources of DR leasing.

It is not clear whether current rules exist requiring fair dispatching of DR. If dispatching is solely up to the utility, it could either under-dispatch DR or refuse dispatch all together. In either event, the DR still has the option to not choose to allow the utility to dispatch its load and could choose to sell its product in wholesale markets or as an ARES. The more subtle abuse by the utility is in under-dispatching, which might go on unnoticed for a long period of time.

8. What other issues or problems arise from the incumbent utility owning, operating and deploying DR?

Staff is unaware of other concerns in this area.

9. How is the natural gas industry impacted by DR? Is there a need for changes in the rules, practices, tariffs or market structure to facilitate the cost-effective application of DR?

With natural gas being the fuel of choice for many of the new DR in the market, there could be a significant increase in the demand for natural gas. This increase in demand for natural gas associated with an increase in DR could effect the market price for gas.

In addition, gas companies might be best situated to enter the DR market in electric generation. Not only do they already control the commodity that they will use as fuel but, due to the lack of affiliate rules covering their relationship to possible electric DR affiliates, they could have a real advantage over other DR. Without these controls, a competitive advantage can be gained by the gas company in the use of existing customer information, pricing of gas products to be used in the generation process, and market knowledge of existing gas systems. Just as affiliate rules were established between utilities and their marketing counterparts in the electric industry, Staff believes the gas industry should have similar rules to govern their activities if they enter the electrical generation markets.

10. How does the deployment of DR impact competition for the delivery of power and energy?

As mentioned earlier in the paper, as DR are introduced into the markets, they are going to exert increasing pressure to open distribution systems to competition. As DR obtain increasing segments of the retail customer base, there will be advantages to them from owning their own distribution networks instead of leasing space on native utility systems. This will most likely occur in the new development areas of the distribution systems and in the larger commercial segments. If a DR locates in a business complex, they might realize savings by installing their own distribution system as opposed to wheeling power over existing utility lines. The same is true for new developments in which a DR might want to provide not only power but distribution facilities to all new construction within that area. As mentioned earlier, this could cause "pocketing" of distribution systems, "First in Field" arguments between utilities and DR, and problems in growth planning for future distribution system expansion.

11. Please provide any additional comments (you may include procedures for the Commission to address or any issues that are of concern).

It should be recognized that despite Commission efforts to foster development of efficient DR in our markets, localized zoning restrictions could be the greatest hurdle in DR application on the distribution grids. Though Commission authority can cover many areas of the operation of DR facilities, local government bodies have the final zoning and permitting authority needed for actual DR location within their corporate limits. With this final authority, all efforts by the Commission to foster DR applications could be stopped by the local authorities. Not only can local policies be a deciding factor, due to the very nature of the hearing process to gather public opinion, native utilities can use the open forum to wield their power in an effort to sway opinion against a potentially competing DR application.

In summary, DR located in Illinois could be beneficial to consumers and utilities alike if care is taken to provide the opportunities for their development. Staff does not advocate using subsidies or other artificial advantages to foster DR development. Instead, Staff supports policies directed at promoting competition through eliminating the artificial barriers to DR development and utilization.

Table 24. Existing Capacity at U.S. Nonutility Power Producers BY STATE, OWNER AND FACILITY, AS OF DECEMBER 31, 1998

Owner/Facility	Nameplate Capacity (megawatts)	
Kincaid Generation L. L. C.	0.0	
A E Staley Manufacturing Co Decatur Plant Cogen	62.0	
Alpharma Incorporated	3.3	
Amoco Research Center Cogeneration Facility	8.3	
Archer Daniels Midland Co Chicago	2.6	
Clinton	31.4	
Decatur	261.0	
Galesburg	3.0	
Peoria	64.0	
Steger	1.0	
Taylorville	4.6	
Armour Pharmaceutical Company Centeon L L C	4.3	
Art Institute of Chicago	1.5	
Bio Energy Partners Greene Valley Gas Recovery	6.0	
Bio-Energy Partners CID Gas Recovery		9.0
Kankaee County Landfill Gas Recovery	1.6	
Lake Gas Recovery	12.0	
Milam Gas Recovery	2.4	
Settler''s Hill Gas Recovery	3.9	
Tazewell Gas Recovery	1.6	
Woodland Landfill Gas Recovery	1.6	
Board of Education, Evanston Township		
High School District 202	2.4	
Browning-Ferris Gas Serv Inc		
Mallard Lake Generating Facility	20.4	
Modern L/F Generating Facility	2.9	
Rockford Generating Facility	2.0	
Waukegan Generating Facility	3.0	
Bunge Foods	3.8	
City of Kankakee Hydroelectric Facility	1.2	
Corn Products International -Illinois	59.5	
Cyprus Rod Chicago, Inc.	2.3	
CGE Ford Heights, LLC CGE		
Waste Tires to Energy Project	23.5	
Dixon Marquette	14.1	
Duraco Products, Incorporated	1.6	
DuPage Co Environmental Region 9		
West Wastewater Treatment	1.5	
Fox Metro Water Reclamation District	2.2	
FSC Paper Co/Wisconsin Tissue		
Alsip Paper Condominium Association	8.6	
General Mills, Inc. - West Chicago	6.6	

Table 24. Existing Capacity at U.S. Nonutility Power Producers BY STATE, OWNER AND FACILITY, AS OF DECEMBER 31, 1998

Owner/Facility	Nameplate Capacity (megawatts)
Hoffer Plastics	7.2
Tim Huey Corporation(DBA) - Huey Forest Products	3.0
Hydro-Op One Associates Dayton Hydro	3.6
Ingersol Milling Machine Company	4.9
Interstate Brands Co Chicago Baking Co	1.1
IMC Nitrogen Co. Imc Nitrogen Co	3.5
IVEX Corporation IVEX Corporation	3.8
Jacobs Energy Corporation	5.7
Jefferson Smurfit Corporation (U.S.)	12.5
John Deere Harvester Works	10.0
Klein Tools Incorporated - Chicago	1.6
Koppers Industries Inc Chicago Plant	7.5
KMS Bakery Power Partners L P	
Entenmann''s Co-Generation Facility	1.6
Lauhoff Grain Company	20.0
Little Company of Mary Hospital	4.0
LTV Steel-So. Chicago Works	9.5
M&M/Mars Inc.- Chicago	3.5
Illinois Marathon Oil Co Illinois Refining Division	12.0
Marcap Corporation IIT Cogeneration Facility	8.0
Metro Water Reclamation Lockport Powerhouse	13.5
Mobil Oil Corp Joliet Refinery	39.6
Moose International Power House	2.0
MWRD: Stickney Water Reclamation Plant	3.0
Nalco Chemical Company	4.7
Northern Illinois Gas Company	2.6
Panduit Corporation - Tinley Park	1.5
Pekin Paperboard Company L/P	1.5
PPG Industries, Incorporated - Works 14	4.8
Resource Technology Corp Biodyne - Congress	4.3
Biodyne - Pontiac	1.8
Biodyne-Lansing	2.2
Biodyne-Lyons	4.5
Biodyne-Peoria	4.3
Biodyne-Springfield	3.3
Shell Wood River Refining Company	20.0
Sherman Hospital	1.6
Sisters of Holy Family	
Saint Mary of Nazareth Hospital Center	2.4
Sisters of Resurrection Hospital	1.5
Solutia INC. W. G. Krummrich Plant	6.4
St Francis Hospital	1.6
Star-Kist Foods Inc Gaines Pet Foods Corp	3.2

Table 24. Existing Capacity at U.S. Nonutility Power Producers BY STATE, OWNER AND FACILITY, AS OF DECEMBER 31, 1998

Owner/Facility	Nameplate Capacity (megawatts)
STS HydroPower Ltd Dixon Hydroelectric Dam	3.0
Illinois Thornton Twnshp Schl Dist 205	1.1
Thornwood High School	1.5
Trigen-Peoples District Energy Company	3.3
Abbott Power Plant-Univ of IL/Urbana-Champaign	30.0
University of Illinois Co-Generation Facility	13.0
Village of Robbins Resource Recovery Facility	55.3
Viskase Corp Chicago East Plant	4.9
Warner-Lambert Company - Rockford	4.8
Wells Manufacturing Company-Dura-Bar Division	6.3